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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/047,251	01/14/2002	Collin E. Thomas	TEXG:003USD1	6847

7590 05/04/2005

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EXAMINER

HANLEY, SUSAN MARIE

ART UNIT	PAPER NUMBER
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1651

DATE MAILED: 05/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/047,251

Applicant(s)

THOMAS ET AL.

Examiner

Susan Hanley

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 October 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 20,25-27 and 32-51 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 20,25-27 and 32-51 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>3/2/05, 4/18/05</u> . | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

Susan Hanley is now the examiner for this application. Her contact information can be found at the conclusion of this office action.

Election/Restrictions

Applicant's Petition for the reconsideration of the finality of the restriction requirement filed 10/12/05 is acknowledged. Based on the petition decision, claim 20 is identified as a linking claim and the restriction between Groups I-IXI is maintained, absent an allowable linking claim.

After consideration of each of the compounds with regard to the claimed method, the claims are rejoined.

Claims 20, 21, 25-27 and 32-51 are pending.

Declaration

The declaration under 37 CFR 1.132 filed 10/12/05 is sufficient to overcome the rejection of claims 20-21, 26 and 28-31 based upon as being anticipated by Thomas et al. (US 6,448,472) under 35 U.S.C. 102(e).

Response to Arguments

Applicant's arguments, see page 15, filed 10/12/04, with respect to the rejection(s) of claim(s) 20-21 and 31 under 35 U.S.C. 102(b) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of newly found prior art.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the

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art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 21, 25-27 and 32-51 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for decreasing the drug resistance in a target plant by contacting said plant with a compound consisting of the molecules I-XIX or $\text{Al}_2(\text{SO}_4)$ hydrate (see below) to inhibit ecto-phosphatase, thereby down regulating the ABC transporter, wherein the ABC transporter can be *Arabidopsis thaliana* AtPGP-1, wherein the ecto-phosphatase can be from the specie *Pisum sativum*, does not reasonably provide enablement for decreasing the drug resistance in a plant by contacting said plant with any possible compound to inhibit ecto-phosphatase. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make or use the invention commensurate in scope with these claims. The claims are drawn to a method for decreasing drug resistance in plant cells by contacting the cell with a drug resistance-inhibiting amount of an ecto-phosphatase inhibitory molecule. Dependent claims further recite the down regulation of the ABC transporter, name specific compounds or limit the ecto-phosphatase to *Pisum sativum* apyrase.

The specification discloses that loss of drug resistance is achieved by suppressing the breakdown of extracellular ATP through the down regulation of ecto-phosphatases with or without concomitant down-regulation of ABC transporters. The specification teaches that apyrases are membrane bound and hydrolyze the gamma phosphate of ATP. Prior to this application, "there has been no identification of specific inhibitors of ecto-phosphatase" (p. 10). A high-throughput screen was developed to identify ecto-phosphatase inhibitors. The specification does not identify the library used for screening. However, compound I-XIX are identified as ecto-phosphatase inhibitors and are said to fall within five classes of compounds based on functional group.

The instant specification does not provide the skilled artisan with guidance to choose the next likely compound that will inhibit a plant ecto-phosphatase because it does not describe a method to design and make analogs that potentially serve as ecto-phosphatase inhibitors. The disclosure of a high

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throughput screen of thousands of compounds and a general classification of the compounds I-XIX by functional group does not provide the skilled artisan with guidance pertaining to the desired analogs relevant structural or physical characteristics that would render an analog as a potential ecto-phosphatase inhibitor. The structures of the compounds I-XIX are diverse and appear to be unrelated. The specification lacks disclosure that provides the skilled artisan with a structural analysis of the disclosed compounds that would guide the practitioner with methods of determining how to alter one of the disclosed inhibitors to yield an analog that has the desired properties. The prior art does not solve this problem. As disclosed in the instant specification, there are no known inhibitors of ecto-phosphatases. Although a search of the literature turned up $\text{Al}_2(\text{SO}_4)$ hydrate as an ecto-phosphatase inhibitor, it is an inorganic molecule and bears little resemblance to compounds I-XIX.

It appears that the ecto-phosphatase inhibitory active of compounds I-XIX is one skilled in the art would be unable to select the next compound and expect it to possess the same set of properties. If the method of claim 21 is not generally applicable to any compound, then the desired ecto-phosphatase activity of every possible compound would be considered individually. This would be considered undue experimentation.

There is no reliable method that predicts which compounds have the desired ecto-phosphatase inhibitory activity that will decrease drug resistance in plants as described in the specification. Applicants acknowledge that there were no known ecto-phosphatase inhibitors and the prior art discloses only $\text{Al}_2(\text{SO}_4)$ hydrate. The specification does not teach how one of ordinary skill in the art could decide *a priori* which compounds will have the desired ecto-phosphatase activity in plants. The limited disclosure cannot be extrapolated by the skilled artisan to predict which compounds will have the desired ecto-phosphatase activity in plants. It would require one of ordinary skill in the art undue experimentation to determine what which compounds will have the desired ecto-phosphatase activity that will reduce drug resistance in plants according to the directions of the instant disclosure. Thus, claims 20, 25-27 and 32-51 are not commensurate in scope with the enabling disclosure.

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Claim Rejections - 35 USC § 102

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 20, 25 and 26 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Bernatskaya et al. (1976) with English abstract and Caplus database abstract.

Bernatskaya et al. disclose inhibiting respiration and surface phosphatase activity in the growing section of pea roots by contacting the roots with Al^{3+} (delivered as $\text{Al}_2(\text{SO}_4)$ hydrate (first page, 4th paragraph). The surface activity location is interpreted to mean that the reported phosphatase is an ecto-phosphatase. Phosphatase activity in the resistant pea strain was inhibited more than was the aluminum-sensitive genetic strain. The disclosure meets the limitations of claim 21 because a compound was contacted with a plant and reduced the surface phosphatase activity of a pea plant. The aluminum compound inherently down-regulates the ABC transporter, as in claim 25, since that activity is a function of phosphatase activity. The ecto-phosphatase is from a pea plant which is known as the specie *Pisum sativum*, as in claim 27.

JEAN C. WINTZ
PRIMARY EXAMINER

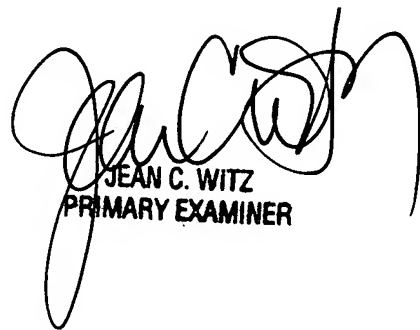
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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Susan Hanley whose telephone number is 571-272-2508. The examiner can normally be reached on M-F 9:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Wityshyn can be reached on 571-272-0926. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Susan Hanley
Patent Examiner
AU 1651



JEAN C. WITZ
PRIMARY EXAMINER